

ON A PRECAUDAL VERTEBRA OF *ICHTHYOSAURUS*  
*AUSTRALIS*, McCOY.

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THE subject of this paper is the imperfect vertebra of a large Ichthyopterigian, referable, I believe, to *Ichthyosaurus australis*, McCoy.\* The original was brought under my notice by the Rev. M. Kirkpatrick, of Bega, N. S. Wales, who obtained it from Marathon, Central Queensland. With his permission a cast was taken for the Australian Museum Collection. As Sir F. McCoy's description was very brief, an extended notice of one of the middle trunk, or anterior pre-caudal vertebrae, may be acceptable to Australian investigators.

The specimen is the centrum of a large vertebra measuring five inches in its vertical and transverse diameters, and rivals in size those of the gigantic *I. campylodon*, Carter, from the European Chalk, the vertebra figured † by the late Sir Richard Owen measuring only four inches high. Our example is devoid of the neural spine, neurapophyses, and pleurapophyses, but having the articular surfaces of the first and last well displayed. The positions of the diapophysial and pleurapophysial articular surfaces leads to the belief that the vertebra is one of the middle trunk series. It is subcircular in outline, slightly narrowed and contracted neurally. Measured across the articular surfaces from the neural to the hæmal margins the diameter is exactly five inches, and in a transverse direction, from diapophysis to diapophysis it is an eighth of an inch short of a similar measurement. Longitudinally measured between the dia- and pleurapophysial tubercles the centrum is exactly two inches, but on the hæmal surface it is a quarter of an inch more.

The concave terminal articular surface visible is deep, terminating in a central fossa, the extent of the concavity being well exemplified by the matrix cast of the anterior cavity of the succeeding vertebrae at the posterior end of this specimen. This mass of matrix represents the "elastic capsule" that intervened between the vertebrae, and retains on its surface portions of the osseous tissue of the succeeding centrum. The periphery or immediate articular rim at each end is narrow, the surface thence sloping rapidly inwards, but the edges of the rims project slightly

\* Trans. Roy. Soc. Viet., viii., 1868, p. 41.

† Owen—Mon. Foss. Reptilia Cret. Formation, p. 79, pl. xxii.

outwards, thus rendering the longitudinal or lateral surfaces of the centrum somewhat concave. The depth of the concavities is an inch, or perhaps a little more, and a longitudinal section of the centrum would be, in consequence, of a strongly hour-glass shaped outline. The floor of the myelonal canal is three-quarters of an inch wide, the joint faces of the neuropophysial surfaces rather triangular on very strongly raised fore and aft synchondrosial articular elevations, the space between these and the diapophysial tubercles is roughly three inches, the latter having descended in close contiguity to the parapophysial tubercles. It is clear, therefore, that this vertebra from the wide disassociation of the neural and diapophyses occupied a position in the column certainly more than one-third of the trunk from the head, and, according to Owen's measurements, was near about the forty to forty-fifth vertebra, for in this region in *Ichthyosaurus*, the dia- and parapophyses form a pair of separate tubercles on each side near the anterior end of the centrum.

The diapophyses are set further in from the anterior articular edge than the parapophyses; these are close to the latter, but are not connected with it by a "neck." Both are represented by large and strong rounded tubercles, separated from one another by an interval of two-eighths of an inch, this interstitial surface being deep and groove-like. The hæmal surface is quite plain.

The posterior concave articular surface is infilled with matrix, affording a complete cast of the next succeeding anterior cup, and even retaining a portion of the osseous tissue of the latter adhering to it. This tissue throughout the centrum is well preserved and dense.

The specimen is certainly of the Campylodont group of *Ichthyosauri*, and occupies an intermediate position in outline between an "early posterior dorsal" and a "late posterior dorsal" vertebra of *I. trigonus*, Owen.\*

The largest *Ichthyosauri* attained a length of from thirty to forty feet, and the present meridional species was in no way inferior to its gigantic fellows of the European Secondary seas. If we apply a similar method of arriving at the comparative size of an *Ichthyosaurus* as that adopted by Prof. Owen, that the jaw was "thirteen times the length of the vertical diameter of an abdominal or anterior caudal centrum," we see in the present fossil the representative of an animal possessing a jaw a little over five feet in length—thus  $13 \times 5' = 65' = 5' 5''$  long. Prof. McCoy computed† the remains of his type specimen to represent

\* Lydekker—Brit. Mus. Cat. Foss. Reptilia and Amphibia, 1889, pt. 2, p. 26, figs. 13 and 14.

† Trans. Roy. Soc. Vict., ix., 2, 1869, p. 77.

an animal twenty-five feet long. Similar vertebra to that now described he states possessed a diameter of four inches, and elsewhere he remarks\* that the longitudinal measurement reached one and a half inches. The elastic capsule was also preserved in some of his specimens.

Mr. R. Lydekker, in the previously mentioned "Catalogue," gives a list of species that "cannot be classified."† Amongst these are *I. australis*, McCoy, and *I. marathonensis*, mihi. I am afraid he has overlooked Sir Frederick's principal paper on his *I. australis*, wherein, although the description is meagre, the latter specially compares the teeth of his fossil to those of *I. campylodon*, and says they "have a rough bony square base like those of *I. campylodon* (Carter)" As regards *I. marathonensis*, mihi, less can perhaps be definitely said, but the whole of its structure, so far as we know it, is also after the type of *I. campylodon*. In my paper on this fossil, I called attention to the necessity of affording another name to *I. australis*, Hector, a New Zealand species distinct from McCoy's. This has now been done by Mr. Lydekker terming it *I. hectori*,‡ but unfortunately the species is of no value, from the absence of either description or figure, all that Sir James Hector says about it being "this genus is only represented in the collection by a single vertebral centrum."

*Ichthyosaurus indicus*, Lydk.,§ seems to be an allied species to *I. australis*, and also vied with *I. campylodon* in size. It is from the Ootatoor Group, the homotaxial equivalent of the Chalk Marl and Upper Greensand of England.

McCoy's original specimens were from Walker's Table Mountain on the Flinders River. The present vertebra is, as before said, from Marathon on the same stream. Both are localities in the Rolling Downs Formation, or Lower Cretaceous.

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\* Ann. Mag. Nat. Hist., (3), xix., 1867, p. 355.

† Loc. cit., p. 113.

‡ Loc. cit., p. 113.

§ Pal. Indica (4), i., 3, 1879, p. 27.